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ABSTRACT

This resource monograph is one of a series designed as a teaching guide for field studies. Each guide centers around the exploration, observation, and interpretation of a field site in one of the four geological areas of Florida. Incorporated into the guides are many of the subject-matter schemes of the Earth Science Curriculum Program (ESCP) and three major process schemes: science as inquiry, comprehension of scale, and prediction. The guides also give the teacher information on the planning and execution of the field trip, as well as educational objectives, learning activities, and teaching materials available. On this field study, secondary students observe the topography of the state from central Florida to the west coast of the peninsula. The character of the Gulf Coast and land features resulting from running water, solutions, winds, waves, and ocean currents, and the fluctuation of sea levels are the focal points of the study. Photographs and maps of the areas studied are included, as well as a road log and bibliography. (MA)

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THE CEDAR KEYS AREA ON FLORIDA'S GULF COAST:

A RESOURCE GUIDE FOR FIELD STUDY

By

Dr. Felicia E. West

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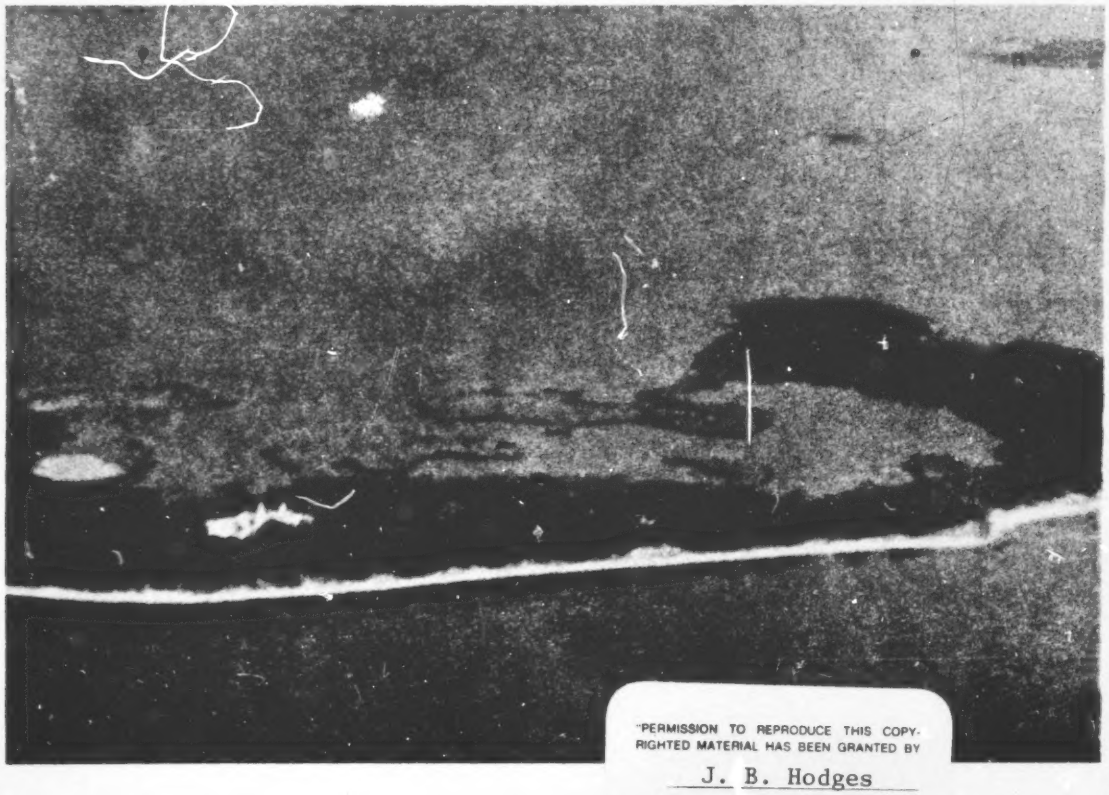

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GAINESVILLE 32611

RESEARCH DEVELOPMENT

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SE 018 606

RESOURCE GUIDE FOR FIELD STUDY OF THE CEDAR KEYS AREA ON FLORIDA'S GULF COAST

By

Dr. Felicia E. West

February, 1974

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Dr. Felicia E. West

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PREFACE

As one becomes more and more aware of the need to understand the earth and its forces and processes responsible for changes associated with the earth as well as its water and its air, a concomitant need develops to encourage teachers and students to study these forces and processes first-hand through the use of field studies. It is believed that in-service teachers need encouragement and assistance as they become involved in the use of this teaching technique and in the use of their communities' resources. With this need in mind, a series of monographs has been prepared by Dr. Felicia E. West at P. K. Yonge Laboratory School. The series presents a case study and resource guides to sites characteristic of four geological areas in the State of Florida.

The case study presents the methods and techniques of planning which include familiarization with the area by the teacher, development of goals and objectives for the study, pre-trip classroom activities, field-trip activities, follow-up activities, and evaluation by the students and teachers involved. In addition, administrative details and the logistics of planning are treated.

Field resource guides have been developed for Little Talbot Island State Park on Florida's northeast coast; for the Devil's Millhopper, a large "collapse sink" near Gainesville; for the Cedar Keys area on Florida's west coast; and for the Flagler Beach area on the Florida east coast. Material which relates to the area between Gainesville and the east and west coasts is included in the guides for the coastal areas. Each of these guides presents geological background information on the area, suggested activities for study in several curriculum areas, safety factors to be considered, and maps and routes. Information which is considered beneficial to teachers as they plan to visit these areas is also included.

The peninsula of Florida is divided into two primary provinces. The central portion of the peninsula in which Gainesville is located is referred to as the Central Plateau or the Central Highlands; the area between Gainesville and the coast is referred to as the Terraced Coastal Lowlands. The subject of this monograph is the area on the Central Plateau and across the Terraced Coastal Lowlands to the present day Gulf shore.

It is hoped that the information included in this monograph will provide some stimulus, assistance, and encouragement to classroom teachers as they plan field studies to this highly interesting area. Your reactions to these materials will be appreciated and aid us in preparing similar materials in the future.

Additional copies of this monograph and others in the series may be had by contacting P. K. Yonge Laboratory School.

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INTRODUCTION

This document discusses educational purposes, age levels, teaching units, and activities to which the site is best adapted; teaching aids available; safety factors to be considered; times available for visitation; and number restrictions on visitors. It is suggested that the teaching style strive to sustain inquiry by encouraging questions, explanations, extrapolations, and speculations based upon the problems themselves.

In developing field guides for the study of the site within the framework of earth science, many of the subject matter schemes around which the Earth Science Curriculum Program (ESCP) is built should be kept in mind. These schemes encompass:

- universality of change
- flow of energy in the universe
- adaptation to environmental change
- conservation of mass and energy in the universe
- earth system in space and time
- uniformitarianism, a key to interpreting the past

The three major process schemes which are to be woven throughout the program are:

1. Science as Inquiry: a search for accurate knowledge and a recognition of the incompleteness and uncertainty of present knowledge; unsolved problems; logical and systematic developments of conclusions from accurate observations and well-chosen hypotheses.

2. Comprehension of Scale: using scales of measurement or units appropriate to the problem; the use of models for the enlargement or reduction of a scale; skill in devising and using models; and an intuitive feeling for scale in the real world and in models.

3. Prediction: extrapolation from the known to the unknown in either space or time; making logical interpretations of past events from fragmentary records; interpreting past events on the basis of given data.

The survey to select sites for the development of the field guide included exploration, observation, and interpretation of each site. Sites which showed only a few processes or features, but showed them at their best, were not eliminated. Some of the following evidences of dynamic changes on the earth's surface are illustrated by the sites reported in this series of monographs.

a. Stream evolution
b. Beach erosion and deposition
   (1) Atlantic Coast - relatively high energy
   (2) Gulf Coast - relatively low energy
C. Dune formation and evolution

d. Coastal features and their formation
   (1) Barrier bars
   (2) Lagoons
   (3) Islands
   (4) Spits and others
e. Relic terraces as evidence of glacial-eustatic fluctuations of sea level
f. Karst topography and its development in the lime-sink area
g. Geologic history of Florida from fossil records
h. Economic geology
   (1) Lime rock quarries
   (2) Phosphate mines
   (3) Heavy mineral mines

The exact sites and routes were selected in order that as many concepts and principles as possible could be developed. Worthwhile student activities are suggested; sets of slides, for which representative prints are included in the monograph, were produced to aid in the teacher's pre-planning and post-discussion of the trip; a bibliography of literature available for the area is included for the teacher's use; and any additional information considered useful to the teacher making the trip is made available.

Two means of assessing field trip experiences were developed in conjunction with The Case Study of Hogtown Creek and are presented in that monograph. Included also in the case study are models for a student field guide and for development of behaviorial objectives and activities for field trips. This monograph and the others in the series are available on request from P. K. Yonge Laboratory School.

A list of sites for which additional trips have been developed, subjects of other monographs, is given below.

a. The Devil's Millhopper - Karst topography and fossil and stratographic records. (Resource Monograph #2)
b. Little Talbot Island State Park - Coastal features and their formation. (Resource Monograph #3)
c. Atlantic Coast from St. Augustine to Flagler Beach - Coastal features and their formation. (Resource Monograph #4)

RESOURCE GUIDE FOR FIELD STUDY OF THE CEDAR KEYS AREA
ON FLORIDA'S GULF COAST

Background and Description

This field trip provides the opportunity to observe the topography of Florida from the Central Highlands across the Coastal Lowlands to the west coast of the peninsula. The peninsula, the Floridian Plateau, has been in existence for millions of years. During this period, however, it has been alternately high and dry or covered by shallow seas. Tectonically, the area has been relatively stable; a slight arching or doming of North Central Florida occurred during the Miocene times. The Eocene limestones in this area are buried under varying depths of younger sediments such as the "Alachua Formation," the Hawthorne Formation and Pliocene to recent sands and clays. These younger deposits were laid down on the erosional surface of the Ocala Limestone, and were shaped into the present topographic structures by (1) running water, (2) solution, (3) waves, winds and ocean currents, and (4) the fluctuation of sea levels. The features resulting from these four factors and the character of the Gulf Coast are the foci of the eight sections in which the trip is divided.

Section I: Gainesville to Newberry - 17.4 Miles (Figure 1)

The journey begins at the intersection of U.S. 441 and University Avenue. The elevation at this point is approximately 165 feet a.s.l. (above sea level). As one moves west on Florida 26 the surface of the Okefenokee Terrace is left behind and the valley flood plain of Hogtown Creek is entered. The elevation of this flood plain is slightly higher than that of the sink into which it drains and is approximately 75 to 80 feel a.s.l. This flat plain is slightly more than a mile in width. Once it is crossed, the elevation changes and a change in vegetation is evident. A mesophytic hammock may be seen on the left; this type hammock exists between two extremes in environment -- hot and dry areas and very moist ground areas. The hammock contains trees such as magnolia, dogwood, holly, laurel oak, and elm and is indicative of a well-balanced water supply. A few miles farther on one passes under I-75 where the terrain is rolling as the erosional remnants of the Central Highlands are crossed. There are well-kept pasture lands with isolated boulders of chert and limestone scattered by the roadsides. Solution features become more and more evident as the route extends westward. About two miles east of Newberry the Dixie Lime and Stone Company quarry is conclusive evidence of the limestone plain over which the journey has carried you. The houses in the town of Newberry emphasize man's use of his natural resources. Limestone is one of the primary economic resources of the area; many of the houses are made of limestone as are driveways and decorative structures. The roads in the town of Newberry are quite representative of solution processes that continue daily in the roadbed resulting in numerous "chuck" holes. The

Figure 1: Gainesville to Newberry

significant feature of this portion of the study is the absence of stream channels, indicating that drainage other than surface is occurring. (Plate 1) The presence of sinks indicates that subsurface drainage is the dominant means of water removal and negates erosion by running surface watter as a factor in topographic development in this area. The clumps of trees associated with the sinks make them fairly easy to identify. The Eocene limestones are overlain in places by the erosional remnants of the Hawthorne Formation and the phosphatic sands and clays, causing phosphate mining activity in earlier times.

Section II: Newberry to Trenton - 13.6 Miles (Figure 2)

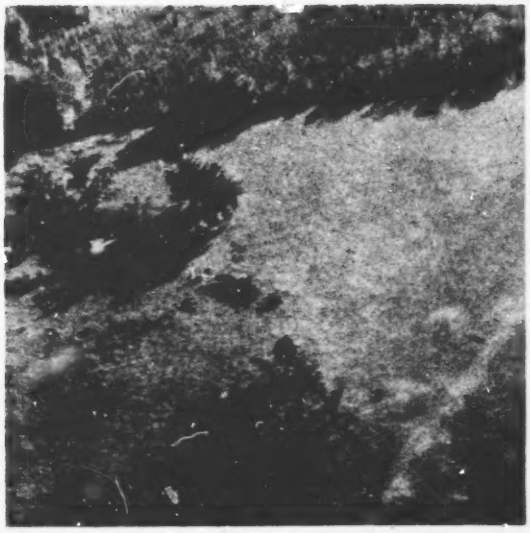
Leaving Newberry the terrain changes as does the vegetation. The tall pines and the pasture lands are left behind and a series of sand ridges are crossed. The ridges support a peculiar type of vegetation -- the turkey oak and long leaf pines -- indicative of deep, dry sands with little nutrient value. The origin of these sand hills is believed by some geologists to be associated with sands of the Wicomico Sea.

The presence of a sink on the left about four miles west of Newberry suggests the unevenness of the limestone surface. If the sands are sufficiently deep over the limestone, a slightly depressed area results rather than a well-developed sink. Some of these depressed areas may be seen along the way.

The sandy hills (the northern extension of the Brooksville Ridge) are left behind and a flat, low-lying plain which lacks good drainage is entered. As cypress ponds and standing water become more and more evident, a change in terrain is again indicated. This area is known as "Waccasassa Flats." The area's origin has been debated by geologists. Some believe that the area is the result of a large stream no longer in existence because of stream piracy; others believe it is the result of marine forces and processes. (Plate 2) The area is covered by "flatwoods" in company with pond cypress. Flatwoods occur where impermeable sediments prevent the downward percolation of surface water causing the pools of standing water along the road. These sediments prevent upward movement of water in dry spells as well as downward percolation. The flatwoods, then, contain vegetation which can withstand the extreme variations in water supply -- too much or too little.

Just east of Trenton the transition from the poorly drained flats to the better drained limestone plains is evident, and man's activities again dominate. Houses appear on the first bit of well-drained ground. Trenton is located on this limestone plain. The land is gently rolling with ridges trending in a general north-south direction. The larger area, including most of western Gilchrist County, is the Chiefland Limestone Plain as described by Vernon (1951). The area is relatively flat and appears to be well drained.

PLATE 1



Karst Feature

PLATE 2

Ancient Sea Floor

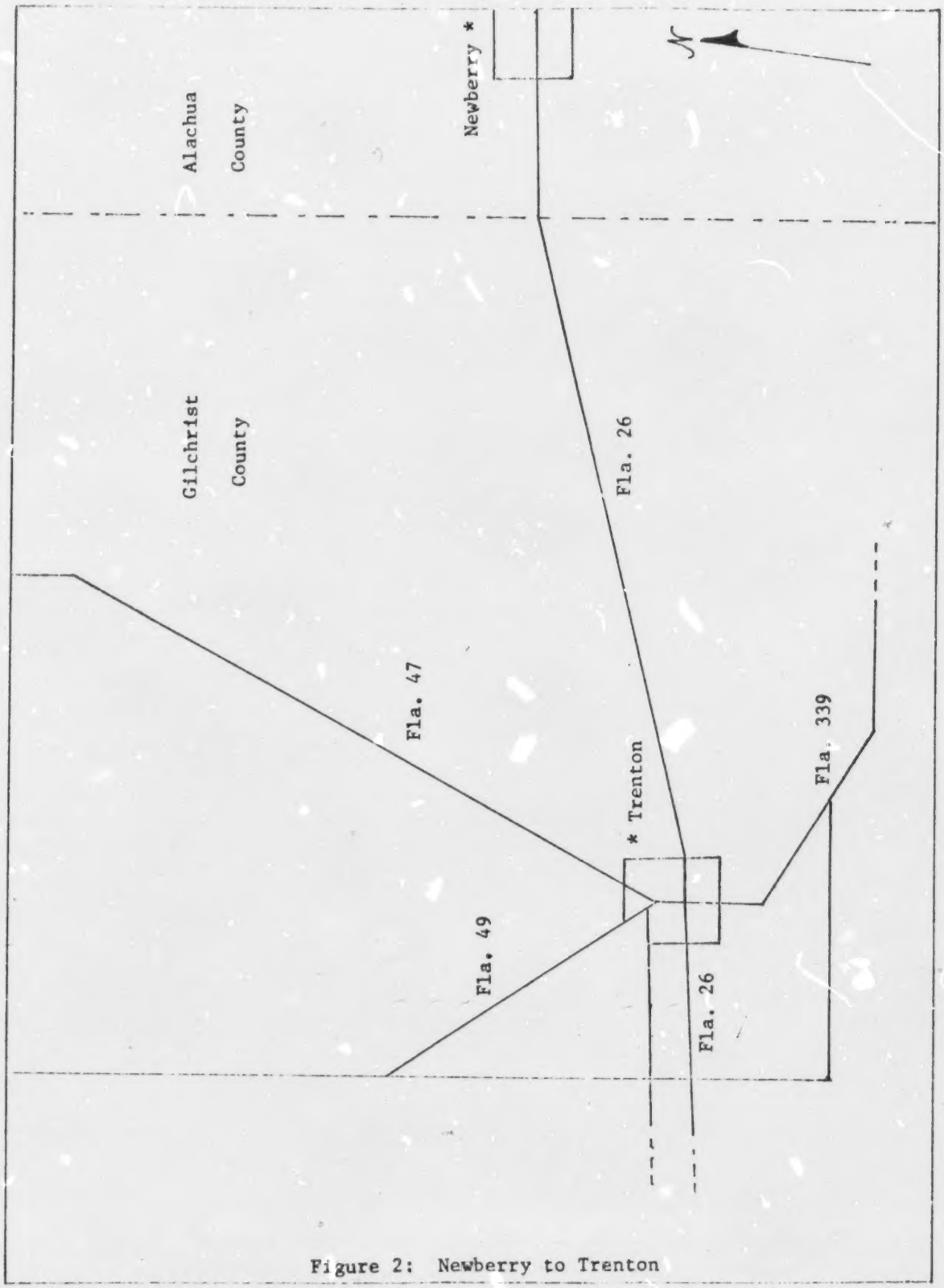


Figure 2: Newberry to Trenton

Section III: Trenton to Chiefland - 18.4 Miles (Figure 3)

The Suwannee River has cut its channel into the Limestone Plain. The western side of the river is bordered by limestone bluffs and hammocks. The valley of the Suwannee River is composed of a thin layer of alluvial deposits overlying the limestone. The outcrops of limestone become more and more evident from Trenton down into the valley of the Suwannee. Many large springs feed the Suwannee along the entire length of the river. The town of Fannin Springs on the banks of the Suwannee is the site of an example of these springs. A short detour from the journey to the coast will enable one to see the Suwannee River at this point. At the intersection of Florida 26 and U.S. 19-27-98 turn north and proceed across the Suwannee River, turn around at the first opportunity and retrace the route. On the south or east side of the river a stop may be made if considered desirable. A small park offers a place suitable for a rest or snack stop.

Proceeding southward on U.S. 19-27-98, the route returns to cross the limestone plain and proceeds to the town of Chiefland. The palmettos and pines of the flatwoods are the dominant vegetation. Tailings from old quarries appear along the highway. Sinks and depressions are numerous on the flat, slightly rolling surface. Florida 320 veers west toward Manatee Springs just north of the town of Chiefland. This is one of the larger springs in the county, and its waters enter the Suwannee River just several hundred feet from its source. Streams in this general area have channels which are a maze of springs or seeps as they flow along the limestone shelves. From the town of Fannin Springs to Chiefland, the lime pits and sinks expose the Ocala Limestone. As the route proceeds from the valley onto the limestone plain and finally to the near coastal areas, the vegetation changes. Hardwood forest and second growth pines are noted in some areas. These gradually grade into pine flatwoods, palmettos, shrubs, and small trees. However, isolated hardwood forests, cypress swamps, prairies, marshes, and bay tree swamps are seen. Further vegetative changes viewed in approaching the coastal area reflect the poor drainage. The forests include cypress and hardwood in association with coastal marshes.

Section IV and V: Near Junction of Florida 345 and Florida 24 and the Cedar Keys Area (Figure 4)

This area is still classed in the "Terraced Coastal Lowlands." Two erosional escarpments are presumably present in Levy County. The topographic features in this area are associated with the Pamlico shoreline. Cedar and scrub oaks grow on the sides and crests of the characteristic salt marshes and ridges of the white sand. (Plate 3) The ridges, trending north and south, are believed to represent sand bars and ridges of both the Pamlico and Wicomico Seas. About one mile west of Sumner, Florida 24 crosses some sand ridges having an approximate elevation of 25 feet a.s.l. From this point west to Cedar Key the elevation seldom exceeds 10 feet. However, on Way Key in the immediate Cedar Key area, the elevation reaches a high of 37 feet and the cemetery area, 27 feet. Both of these areas are surrounded by expanses of salt marshes.

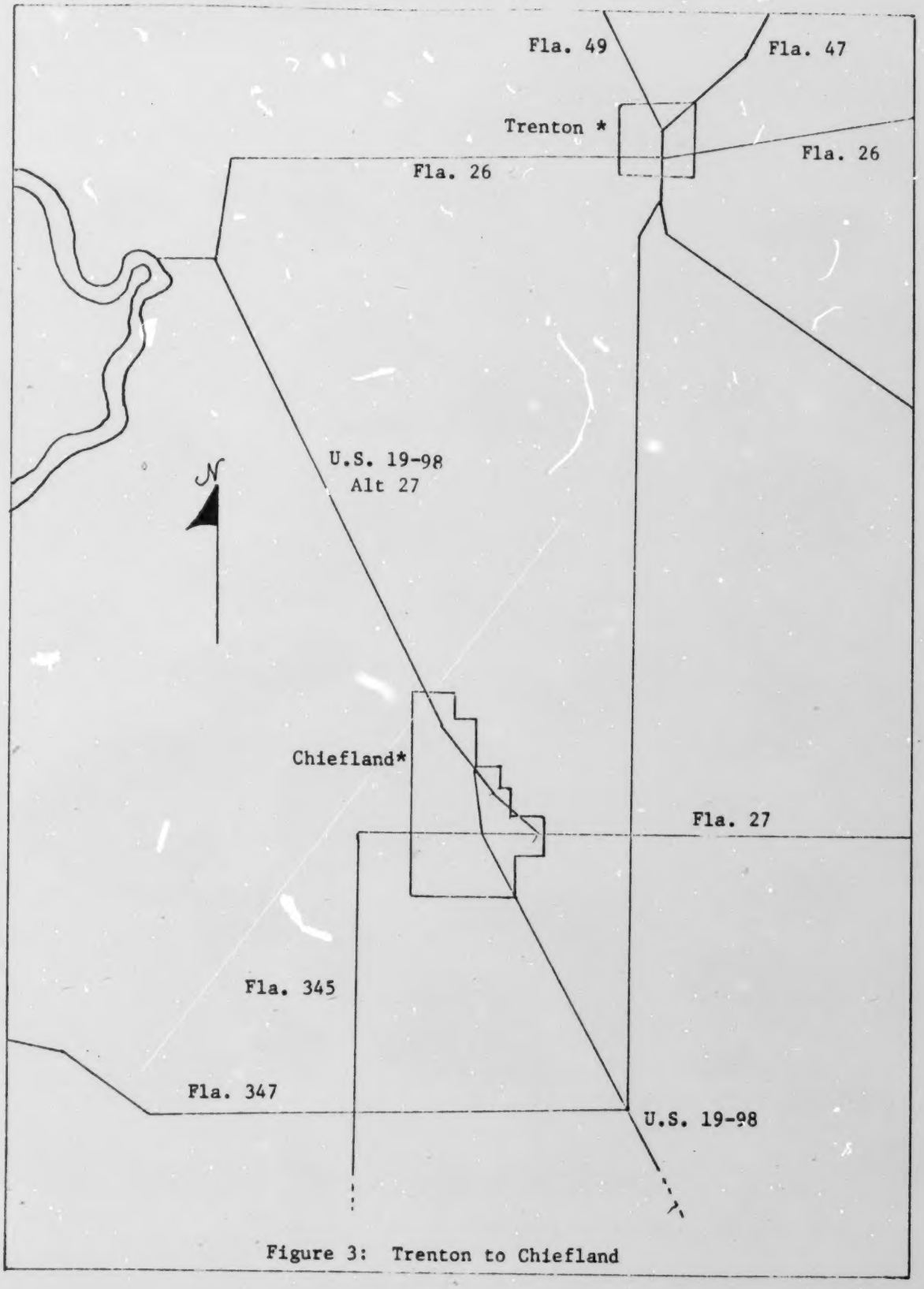


Figure 3: Trenton to Chiefland

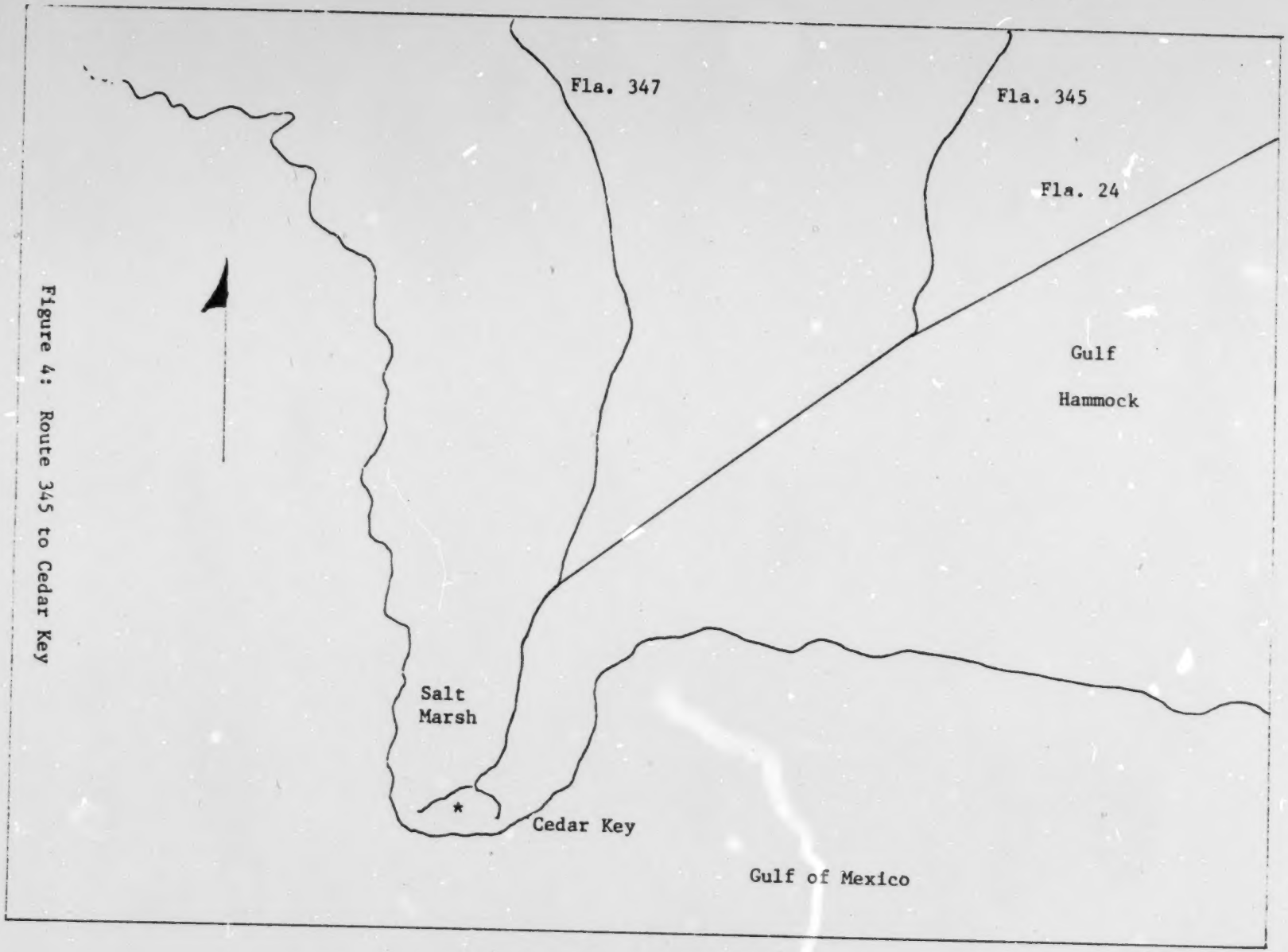
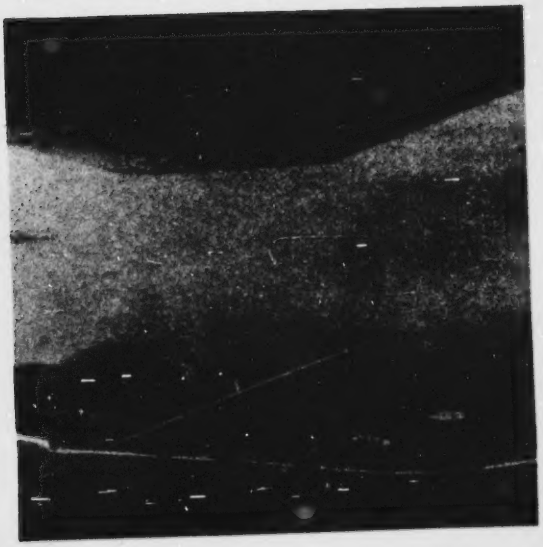


Figure 4: Route 345 to Cedar Key

PLATE 3

Sand in Road Bank

PLATE 4



Seahorse Key off Gulf Coast

Growing in this area is the black mangrove, the hardiest of the mangrove trees. Farther south along the Florida coast, additional, but less hardy, species of the Florida mangrove are found. Cedar Key represents approximately the northern limit of the mangrove.

The Cedar Key area is quite characteristic of the Gulf Coastal area. A broad expanse of salt marshes border the coastline of the entire area and extends for many miles north and south of Cedar Key. (Plates 4 and 5) A thin veneer of sand overlays limestone along the coastal area. The marshes, extending landward over these limestones, and the many drowned valleys and inlets classify this coast as one of submergence. Speculation of some geologists suggests the bowing down of the peninsula or a slow rotation around an axis, making the east coast one of emergence. Other geologists suggest rising sea levels have submerged the coastal areas which were shaped during previous stands of lower sea levels. This alternative implies that the peninsula is stable as far as rotation around any axis is concerned.

An hour in the Cedar Keys area is well spent examining several aspects of the area, including its cultural history presented in a State museum there. Highly profitable is observation of the differences between the coastal and vegetation features here and those on the east coast. Both the vegetation and the profiles of the "beaches" are quite different. Oyster beds, exposed at low tide in Cedar Key, and the many fishing boats attest to the activity of present day residents. The characteristic oyster bed environment, found in the Cedar Key area, suggests that the oyster shells found on Little Talbot Island do not belong in the present day environment of that coast.

The return to Gainesville retraces the route from Cedar Key along Florida 24 to intersect with Florida 345; but, instead of turning north, continue along Florida 24 toward Bronson in the northeastern part of the county. Cabbage palms seen in the distance off both sides of the road are further evidence of the limestone or alkaline soils. The fire tower at the junction of 345 and 24 stands on a hammocky area of pine and oak at an elevation of approximately 15 to 18 feet a.s.l. This lies in the belt of the Pamlico Terrace and is a limestone flatwood and hammock area. The various timbers of Florida grow in the area and cypress, cedar, pine, gum, maple and bay, to name a few, may be seen from the highway.

The various springs originating in this area probably do so in springheads in limestone bedrock, and many of the stream channels appear to be collapsed caverns. The exposed limestone along the roadway is seen in traveling northeast through this area. During wetter periods, however, the limestone boulders are separated from the roadway by standing water on both sides of the road, since Levy County generally has poor surface drainage. The sand-covered plains and hills and solution features capture most of the surface waters. Good surface drainage occurs only near the coast and near the two major streams.

PLATE 5

Gulf Coast Estuary

Sections VI, VII and VIII:
Otter Creek to Gainesville
(Figures 5, 6, and 7)

Between Cedar Key and Otter Creek, bridge after bridge is crossed as streams connecting the various marshy areas flow toward the sea. The limestone plain here is covered with open pine flatwoods with isolated stands of hardwoods and cypress swamps. Northeast of Otter Creek the Waccasassa River is crossed. This river rises in northern Levy County as a well-defined channel, but its source includes several ponds and marshy areas in Gilchrist County. This area, referred to as the Waccasassa Flats area, is crossed on the western portion of the field trip. The limestone in the valley of this river is buried deep beneath sands and clays. The valley width is not significantly related to the size of the present valley stream. The differences between the sizes of the two features is of great significance, however. The valley extends northward to the Santa Fe River -- well beyond the extent of the present day Waccasassa River. The origin of this long wide valley is still debated.

The town of Bronson sits on a sand ridge or series of ridges. The sands are deep and yellow and the vegetation is characteristic of such an area. There are many turkey oaks and few pine lands with a heavy growth of very conspicuous rosemary. The soils are poor and of little value for use as farmland. No streams are found between Bronson and Archer; and the number of lime pits, sinks, and depressed areas become more and more numerous. This area, classified as the Williston Limestone Plain area, reaches all the way to Paynes Prairie in Alachua County. Its limestones are overlain by phosphatic sands and clays, and a corresponding increase in the number of farms is noted. In the last few miles from Archer to Gainesville, typical live oak hammocks and areas where the long leaf pines have been harvested and are being replaced by oaks are evident. Many abandoned limestone mines and formerly cultivated fields in which the plant growth is proceeding through the sequences of plant succession are observable.

Foci of the Study

Since a field trip through the area does not include quantitative observations to be made by the students, questions are suggested to provide possible foci for study. These may serve as guidelines for the teacher and students and may direct students' observations and attentions. The foci for a specific trip must be developed by the teacher and students involved. Involvement of the students in the planning procedures is not only desirable but nearly mandatory for the success of this type of field study. This kind of trip requires more comprehensive planning than do the specifically aimed field trips as described in the resource guides for Devil's Millhopper and Little Talbot Island.

In light of this needed planning with students, following are possible questions for consideration by the students and the teacher.

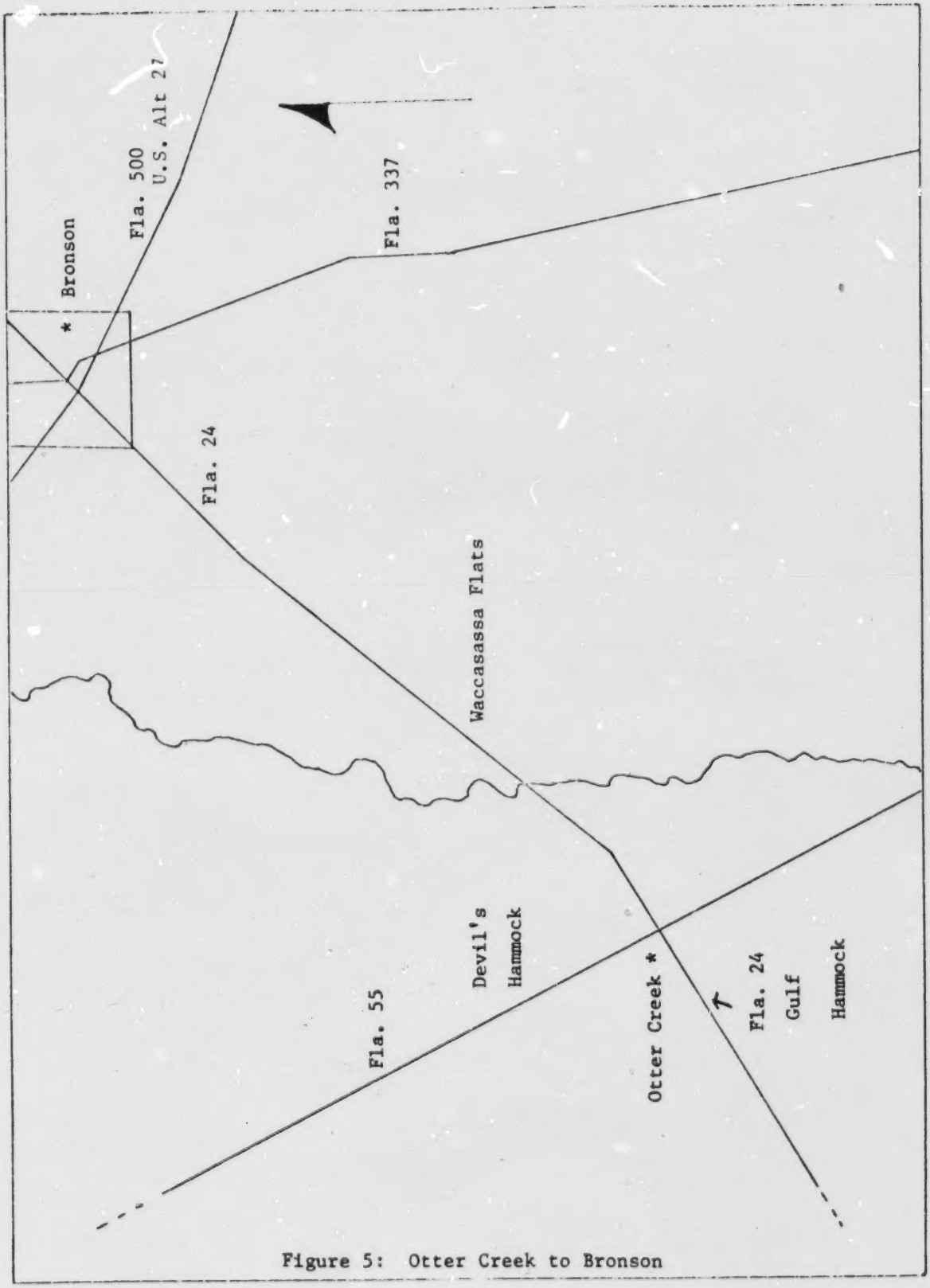


Figure 5: Otter Creek to Bronson

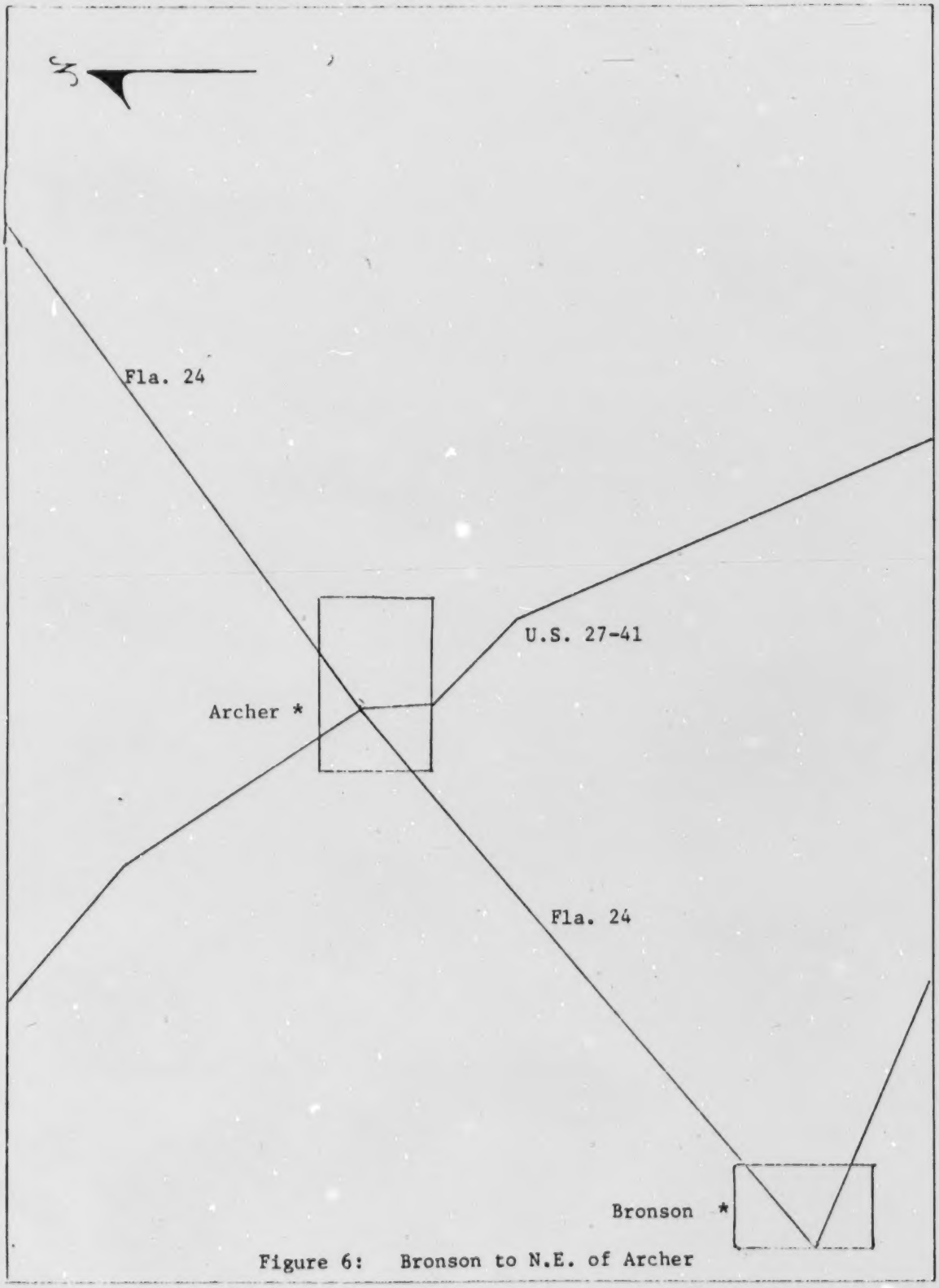


Figure 6: Bronson to N.E. of Archer

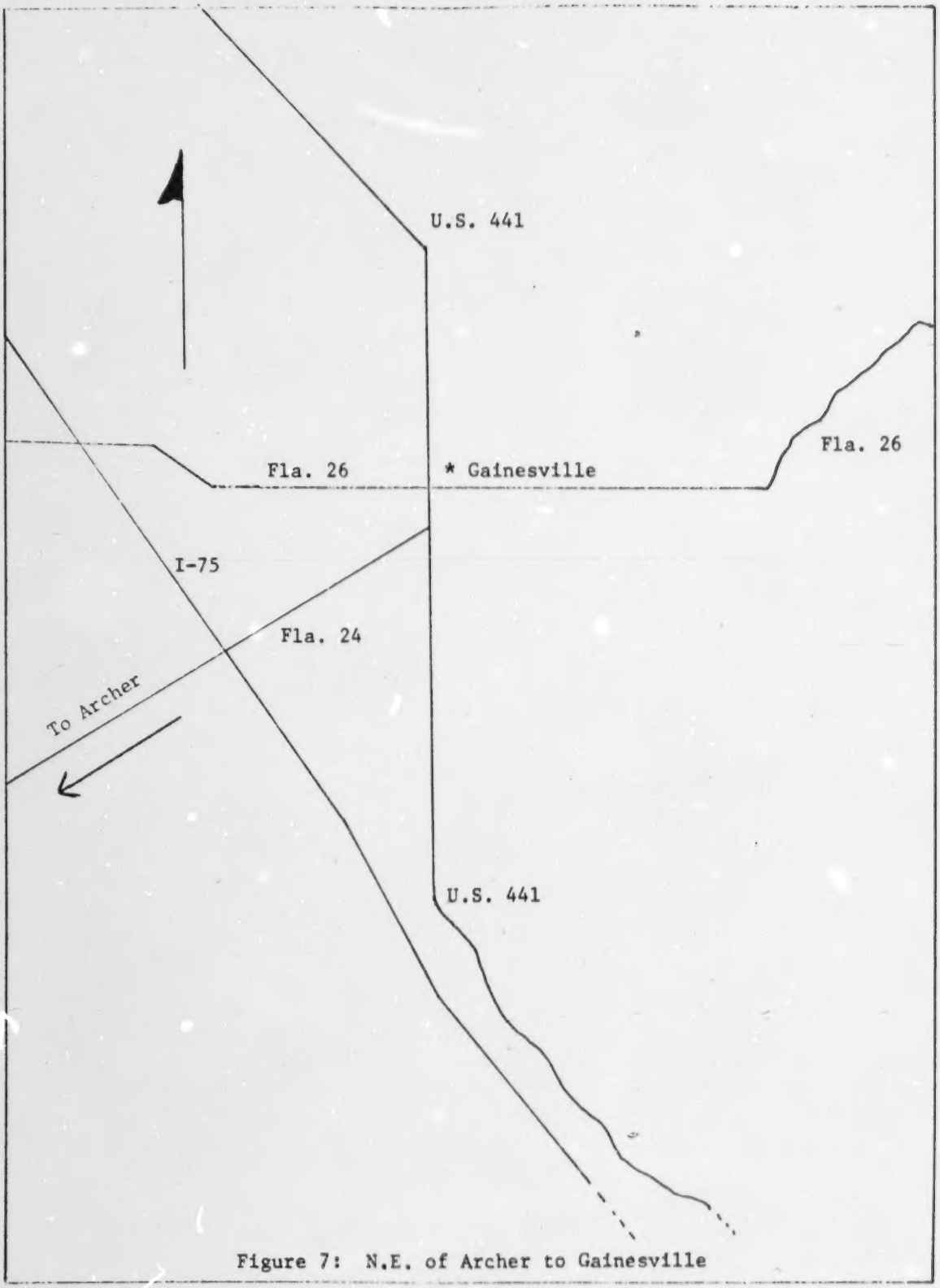


Figure 7: N.E. of Archer to Gainesville

1. Stream density: How has the number of streams observed changed as the study moves from Gainesville to the coast?

2. Natural resources: What natural resources are being used as an economic base for the various communities?

3. Botany and geology: On the basis of the geology of the areas and the character of the sediments found in the areas, what explanations are given for the changes in vegetation? (Plate 3)

4. Coastal features: What are the similarities and/or differences between this coastal area and that of Little Talbot Island on the east coast? (Plates 4 and 5)

5. Marine deposition and/or erosion: What evidences are there which might indicate that the controlling factors in the development of the topography of this area were marine deposition or erosion? (Plate 1)

6. Karst topography: What features indicate the presence of sub-surface drainage? (Plate 2)

7. Map reading: What features expressed on a topographic map are associated with the physical features over which the journey is made?

These are only indicative of the possible directions sets of questions might take. These are suggested to serve as a point of departure for student-teacher planning. The extent of such a study is limited only by the background and interest of the students and their teacher.

Grade Level to Which Such a Field Trip is Best Adapted

Students below ninth grade level have difficulty sustaining interest for the entire length of the trip. Hence, it is suggested that participation be limited to ninth grade and above. Shorter portions may be adapted for students in lower grades. However, there must not be hard and fast rule which eliminates students who might receive much benefit from such a trip. The teacher knows his students and must consider their interests and abilities to participate in such a trip.

Safety Factors, Hazards, or Special Conditions to Consider

Few hazards are encountered on this trip. The primary danger comes in loading and unloading the bus along busy highways. Prior to making this trip, the teacher should drive through the route and determine safe places to stop or places to issue warnings where stops are desired which might prove dangerous if students are not cautioned about traffic.

Teaching Units to Which Trip is Best Adapted

Such a trip may be adapted to nearly any aspect of the earth science program and to many areas of the entire school curriculum.

The student may be asked to make his observations on such a trip from many points of view:

1. Cultural: man's relationship to his immediate environment.

2. Geographical: the relationships among geographical features, man's utilization of the natural resources, and the economic development of the area.

3. History: the rise and fall of the importance of various centers of population along the route. (Cedar Key was once a thriving metropolis compared to its present status. A State museum there presents the area's cultural history.)

4. Earth science: the relationships between the forces of nature and the topographic expression of the land's surface.

5. Oceanography: a study of coastal features on a low energy shore as compared to the features on a high energy coast.

6. English: the compilation of a journal of the trip, reports, and literature research.

The above represent only an indication of possibilities which may be extended across the curriculum. Each teacher again must determine the extent to which he desires to expand the objectives and activities of a trip such as this.

Days and Hours Available for this Trip

The round trip distance is approximately 140 miles. If a tour around Cedar Key is included, the total mileage may increase to approximately 150 miles. The trip may be made by car in about three hours; however, the time required to include a class of students, a number of adults and several stops (rest, lunch, and investigative) requires the entire day. The trip must be paced slow enough to allow inexperienced students time to make their observations but fast enough to maintain their interest and anticipation. Again, the teacher must determine how to pace the trip on the basis on the needs of his specific group of students. Each time the trip is taken, the teacher must evaluate the degree of success and failure experienced.

Number Restrictions

Any field trip is more effective if a small group (no more than 20 students) is involved. Larger groups (say 45 students) require additional planning for such things as sites for rest stops, eating facilities, time for loading and unloading the bus, and ways for maintaining communications. If a large group is to go, a pre-trip visit to rest stop sites and an explanation by the teacher helps promote positive school and community relations. A "bull-horn" or megaphone for communicating with the large group on the bus also helps; but some problems, originating because of a large group, cannot be anticipated. Enough adults should accompany the group in order that communication may be carried on between each smaller group and its accompanying adult. The adults involved may then determine when a total group meeting for discussion is needed. The number restriction then should be determined by the teacher on the basis of bus size, age group, and number of adults who will be accompanying the group.

Accommodations

Several places in each of the small towns are acceptable as rest stops or lunch breaks. Since this is not an overnight trip, other accommodations are not necessary. If the group is large, it is best to carry lunch along. If the group is small, lunch may be bought at several small restaurants along the way. The selection of the restaurants and rest stops should be made by the teacher on the basis of group size, and arrangements should be made prior to the visit by the class.

Fees

There are no fees unless the teacher decides to visit the small museum in Cedar Key. That fee is nominal, and arrangements should be made prior to the visit. Students should arrange to have money for cold drinks and snacks as they desire them.

Education Purposes Possible of Achievement

The opportunities offered students making this or similar trips are innumerable. The teacher and students must decide upon the purposes and the objectives of such a trip. Based on the description of this area and a pre-trip visit, the teacher itemizes the objectives on the basis of the needs of the specific class. Educational purposes must be definite and clear to students to achieve maximum benefit.

A detailed description of the process for developing behavioral objectives and a model student field study guide are contained in A Case

Study of Hogtown Creek: A Justification for Field Observations, The Devil's Millhopper: A Resource Guide for Field Study, and Little Talbot Island: A Resource Guide for Field Study. These publications are available from the P. K. Yonge Laboratory School on request.

Activities

Because of the nature of such a field trip, activities are divided into three phases: (1) pre-trip activities, (2) field-trip activities, and (3) follow-up activities.

Pre-trip activities might include text studies related to the purposes, objectives, and/or guidelines specified for the trip. Resource personnel (botanists, geologists, naturalists, etc.) may help prepare students for the kinds of observations being considered. A study of topographic maps of the entire area is necessary. The absence of streams and the presence of numerous lakes or sinks, for example, will be noted by some of the more perceptive students. The object of pre-trip activities is to raise and state the questions which will serve as guidelines for gathering information and finding answers during the trip.

Field activities are conducted in two phases: (1) viewing from the bus or stopping to examine certain features more closely and (2) stopping at the end of each section of the field trip for a discussion of the area over which the route has carried the class. A large bulletin board on which the topographic maps can be mounted for large group viewing and discussing of the area should be carried.

Within these two phases students and teachers should record their observations and comments by using a pencil or a camera. An outcome of recordings should be an annotated road log or journal and a set of photographs or slides of the areas visited. Stops for photographs of features characteristic of the area should be made. Stops need not require loading and unloading of the bus unless close examination of a feature is desired.

The purchase of inexpensive cameras (Instamatics and/or Swingers) by the Science Department or the Audiovisual Department is strongly recommended. Many students have cameras; many students, however, have never held a camera in their hands. The opportunity to use a camera may be reason enough for a student to pay close attention to the area over which he is traveling. Becoming adept at using such a camera may have far-reaching effects in the cognitive, psychomotor, and affective areas of learning.

Follow-up activities should capitalize on the work of the students. A display, made by students, using sheets of white cardboard attached to a wall in the classroom, serves to map the route of the field trip. Various features along the route are recorded by the addition of pictures taken by the students, their comments, and by symbols they construct from colored paper or with colored pencils.

The topographic maps should be restudied and the student's observations in picture or note form correlated to the structures indicated on the maps. The pictures and notes may profitably be compared to those recorded on a trip to Little Talbot Island or the east coast. Maps of both coastlines may be compared and their similarities and differences discussed. Now is the time and place for proposing answers to old questions and formulating new ones.

Resource people may be recalled to the class for further discussion if student interest has been maintained. If follow-up activities are extended over too long a period of time, students interest begins to deteriorate. The individual teacher is the only judge of the appropriate length of time to be devoted to these activities.

Teaching Aids and Printed Materials Available

The only teaching aids available for such a trip are topographic maps, county road maps, vegetation maps, and various publications. (See Bibliography.) County road maps may be obtained from the State Road Department in Tallahassee, Florida. The topographic maps are available through the Map Information Office of the U. S. Geographical Survey in Washington, D. C.

Slides made of certain aspects of the area are most effectively used for follow-up rather than pre-trip activities. Plates 1 through 5 illustrate some of the features of this area and are presented on the following pages.

ROAD LOG

Miles	
0.0	Gainesville: University Avenue and 13th Street.
2.2	Hogtown Creek.
3.1	Mesophytic hammock - Area with well-balanced water supply.
5.2	Intersection with I-75.
5.9	Xerophytic hammock - Area with dry, hot conditions; primarily oak trees.
	Rolling terrain; pasture lands. Incipient sinkholes with several identifiable sinks along the way. Dixie Lime and Stone Company.
17.4	Newberry.
20.5	Gilchrist County Line. Turkey oaks and dry sand hills. Dying lake and dead oak trees in a series of sand ridges.
25.0	Waccasassa Flats - Cypress ponds; standing water.
29.7	High ground indicated by man's presence; man has used limestone in the construction of his houses.
31.0	Trenton. Gently rolling terrain.
39.6	Intersection at Fannin Springs with U. S. 19 and 98.
47.8	Horne's Restaurant; rest stop.
49.4	Chiefland; Junction with Florida 345 to Cedar Key.
	Limestone plain; live oaks, palms, etc.; depressions; pine groves with hardwood stands intermingled.
65.7	Area much flatter; pond cypress and standing water, pinelands with palmettos.
69.8	Intersection with Florida 24; salt marshes now in evidence.
72.1	Route moves up on ridge of white sand; cedar and scrub oak in view; series of ridges and swales or lagoonal areas. Saw grass present in marshy areas. Oyster bars in sight at low tide.

80.0 Parking lot on Cedar Key; restaurant; county park.

If time permits, there is a museum in Cedar Key and several interesting sites to visit. See description of area.

82.9 Wooden bridge east of Cedar Key; looking west several cabbage palms in the distance. Limestone outcroppings form little islands in the flat expanse of salt marsh.

84.1 Sand pit showing distinct color changes in the sand.

90.9 Rosewood Fire Tower at intersection of Florida 24 and 345; Oak Hammock and Pine Flatwoods 15-18 feet a.s.l. (above sea level).

102.2 Otter Creek; between the fire tower and Otter Creek eight bridges have been crossed. This area is known as Gulf Hammock. The creeks that do exist flow into Waccasassa Bay. Junction of Florida 24 and U. S. 19 - 98.

106.2 Waccasassa River; cypress swamps and flatwoods.

115.0 Bronson; sits in an area of yellow sands, few pines and many turkey oaks. Just east of Bronson is Rosemary Hill, University of Florida Astronomy buildings -- named for rosemary, a plant that is characteristic of these dry, sandy ridges.

125.4 Archer; Junction of Florida 24 with U. S. 19 and 27. Character of land changes; farmlands; lots of limestone pits; chert boulders; pasture lands; rolling terrain.

140.1 Intersection: University Avenue and U. S. 441.

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